PLEASE AMEND THE CLAIMS AS INDICATED BELOW:

1-48 (Canceled)

49. (New) An electronic power control apparatus for a gas discharge device comprising:

a DC to AC inverter circuit,

the inverter circuit including a high side electronic switch and a low side electronic switch, each of which is operable to a conductive state and a non-conductive state by control signals applied to control terminals thereof;

a resonant circuit coupled to the inverter circuit and connectable to a gas discharge lamp device to provide power thereto;

a programmable integrated circuit master controller including a central processor, a plurality of logic units, and a digital data storage unit which stores operating parameters and data processing algorithms for the master controller; and

a feedback circuit operative to provide feedback signals representing the current through the gas discharge device to the master controller,

the master controller being operative to control the operation of the gas discharge device according to the stored operating parameters, the data processing algorithms and the feedback signals.

50. (New) The power control apparatus of claim 49, wherein the feedback signals are normalized to respective light level outputs of the gas discharge device at a plurality of points in a predetermined dimming range.

51. (New) The power control apparatus of claim 50, wherein the feedback signals are normalized according to a segmented linear representation of a non-linear light level versus current curve for the gas discharge device over the dimming range.

52. (New) The power control apparatus of claim 49, wherein the master controller is operative to control light output of the gas discharge device by repetitively driving the high and low side switches alternatively into conductive and non-conductive states, with the high side switch being in the conductive state when the low side switch is in the non-conductive state and vice versa, and with the conductive and non-conductive times of the high side switch being controlled independently of the conductive and non-conductive times of the low side switch.

53. (New) The power control apparatus of claim 52, wherein the master controller is operable to control the light output of the gas discharge device over a desired dimming range by providing different combinations of conductive and non-conductive times for the high and low side switches for different light output levels within the dimming range.

54. (New) The power control apparatus of claim 52, wherein the master controller is operable to vary the open loop characteristics of the power control apparatus to approximate a substantially constant loop gain over a desired dimming range for the gas discharge device by providing different combinations of conductive and non-conductive times for the high and low side switches for different light output levels within the dimming range.

55. (New) The power control apparatus of claim 49, wherein the operating parameters are stored in the digital data storage unit in the form of a plurality of parameter look-up tables which provide control information for respective functions performed by the master controller.

56. (New) The power control apparatus of claim 55, wherein at least one of the plurality of parameter look-up tables is user programmable.

57. (New) The power control apparatus of claim 55, wherein one parameter look-up table is a segmented linear representation of a non-linear light level versus current curve for a gas discharge device.

58. (New) The power control apparatus of claim 55, wherein the master controller is responsive to data in the parameter look-up tables to control the conductive and non-conductive times of the high side switches independently of the conductive and non-conductive times of the low side switches to achieve desired and stable light levels, desired filament currents and maximized efficiency and increased lamp life over a selected dimming range.

59. (New) The power control apparatus of claim 58, wherein the data in the parameter look-up tables are selected to provide continuously variable conductive and non-conductive times for the high and low side switches over the selected dimming range.

60. (New) The power control apparatus of claim 58, wherein the data in the parameter look-up tables are selected to provide discretely variable conductive and non-conductive times for the high and low side switches over the selected dimming range.

61. (New) The power control apparatus of claim 58, wherein the data in the parameter look-up tables are selected to provide different control loop parameters for steady state operation and transient conditions.

62. (New) The power control apparatus of claim 49, wherein the master controller is operative to dither the conductive and non-conductive times for the high and low side switches.

63. (New) The power control apparatus of claim 49, wherein the master controller is operative to drive the gas discharge device slightly on the inductive side of resonance by controlling the conductive and non-conductive times of the high side switch independently of the conductive and non-conductive times of the low side switch.

64. (New) The power control apparatus of claim 63, wherein the master controller is further operative to adaptively provide a dead time interval between the end of conduction by the high side switch and the beginning of conduction by the low side switch and between the end of conduction

by the low side switch and the beginning of conduction by the high side switch, whereby zero voltage switching of the low and high side switches is achieved.

65. (New) The power control apparatus of claim 64, wherein the master controller is further operative to adjust the dead time interval to account for transient and steady-state operation and/or for aging of the gas discharge device.

66. (New) The power control apparatus of claim 49, wherein the master controller is operative to control the conductive and non-conductive times of the high side switch independently of the conductive and non-conductive times of the low side switches to achieve zero voltage switching, fully-protected operation.

67. (New) The power control apparatus of claim 49, wherein the master controller is operative to control transitions between the conductive and non-conductive states of the high and low side switches by driving at least one of the switches into conduction within an interval in which the reverse conduction of the respective switch occurs, and when the voltage across the switch is approximately zero whereby an inductive half-bridge load which operates approximately at resonance is maintained.

68. (New) The power control apparatus of claim 49, wherein the master controller is further operative to adaptively provide a dead time interval between the end of conduction by the high side switch and the beginning of conduction by the low side switch and between the end of conduction by the low side switch and the beginning of conduction by the high side switch in response to comparison of a measured operating parameter and a reference value.

69. (New) The power control apparatus of claim 68, wherein:

the high and low side switches in the DC to AC inverter are connected in a circuit having a half-bridge topology, and

the measured operating parameter is an output voltage at the half-bridge switch node.

70. (New) The power control apparatus of claim 68, wherein:

the DC to AC inverter circuit includes high side switches and low side switches connected in a circuit having a full bridge topology; and

the measured operating parameter is the output voltages at the full bridge switch nodes.

71. (New) The power control apparatus of claim 68, wherein:

the high and low side switches in the DC to AC inverter are connected in a circuit having a half-bridge topology, and

the measured operating parameter is a rate of change dv/dt of an output voltage at the half-bridge switch node.

72. (New) The power control apparatus of claim 68, wherein:

the DC to AC inverter circuit includes high side switches and low side switches connected in a circuit having a full bridge topology; and

the measured operating parameter is a rate of change dv/dt of the output voltages at the full bridge switch nodes.

73. (New) The power control apparatus of claim 68, wherein:

the high and low side switches are connected in a DC to AC inverter circuit having a half-bridge topology; and

the measured operating parameter is the current in the resonant circuit.

74. (New) The power control apparatus of claim 68, wherein:

the DC to AC inverter circuit includes high side switches and low side switches connected in a circuit having a full bridge topology; and

the measured operating parameter is the current in the resonant circuit.

75. (New) The power control apparatus of claim 68, wherein:

the high and low side switches are connected in a DC to AC inverter circuit having a half-bridge topology; and

the measured operating parameter is a current in at least one of the high and low side switches.

76. (New) The power control apparatus of claim 68, wherein:

the DC to AC inverter circuit includes high side switches and low side switches connected in a circuit having a full bridge topology; and

the measured operating parameter is a current in at least one of the high and low side switches.

77. (New) The power control apparatus of claim 49, wherein the master controller is operative to provide the functions of:

a first pulse width modulator logic circuit;

a second pulse width modulator logic circuit;

a first latch circuit coupled to provide first pulse data to the first pulse width modulator logic circuit;

a second latch circuit coupled to provide second pulse data to the second pulse width modulator logic circuit;

the first pulse width modulator circuit and second pulse width modulator logic circuit being coupled together to generate a pulse train having a pulse width determined in accordance with the first pulse data and the second pulse data,

the pulse train being operative to control the conductive and non conductive times of the high and low side switches;

a dead time controller coupled to the first pulse width modulator circuit and second pulse width modulator logic circuit,

the dead time controller being operative to adjust the pulse train to dynamically vary a dead time interval between conduction intervals of the high side and low side switches up to a maximum predetermined value; and

an abnormal logic circuit which monitors the pulse train to detect a presence or absence of a condition in which the pulse train overlaps with an output of the first pulse width modulator circuit.

78. (New) The power control apparatus of claim 77, wherein:

the abnormal logic circuit comprises a first counter and a monitoring module,

the first counter is incremented when the monitoring module detects that the pulse train does not overlap with the output of the first pulse width modulator circuit; and

the first counter generates an abnormal condition message upon reaching a first predetermined quantity.

79. (New) The power control apparatus of claim 78, wherein the abnormal logic circuit further comprises a second counter which is operative to generate a predetermined quantity of pulse train cycles when the monitoring module detects that the pulse train does not overlap with the output of the first pulse width modulator circuit, and the first predetermined quantity has not been reached.

80. (New) The power control apparatus of claim 49, wherein the master controller is operative to monitor a current through a load driven by the power control apparatus, and to control the current according to a desired dimming level by normalizing the feedback signals to respective light level outputs of the gas discharge device at a plurality of points in a predetermined dimming range.

81. (New) The power control apparatus of claim 80, wherein the feedback signals are normalized according to a segmented linear representation of a non-linear light level versus current curve for the gas discharge device over the dimming range.

82. (New) The power control apparatus of claim 49, wherein the master controller is further operative to adaptively provide minimum dead time intervals between the end of a

conductive period of the high side switch and the beginning of a conductive period of the low side switch and between the end of a conductive period of the low side switch and the beginning of a conductive period of the high side switch for successive cycles of conductive periods of the high side and low side switches by:

predicting a minimum dead time interval value for a particular cycle based on the actual dead time applied in at least one previous cycle;

measuring the actual dead time using the current or voltage or dv/dt measured at a node between the high side and low side switches during the particular cycle; and

employing the measured actual dead time value to calculate the predicted minimum dead time of the next cycle.

83. (New) The power control apparatus of claim 82, wherein the master controller is operative to adjust the dead time interval values between the end of a conductive period of the high side switch and the beginning of a conductive period of the low side switch and between the end of a conductive period of the low side switch and the beginning of a conductive period of the high side switch for successive cycles of conductive periods of the high side and low side switches in order to correct for asymmetry of the dead time intervals of the voltage at the node between the high side and low side switches, and in the output signal of the DC to AC inverter bridge.

84. (New) The power control apparatus of claim 82, wherein the master controller is operative to predict the minimum dead time interval value for a particular cycle by integrating the dead times intervals of at least two previous cycles; and to calculate the predicted minimum dead time for a subsequent cycle by integrating the measured dead time interval for a current cycle with the dead time interval value of at least one previous cycle.